Building Cardiac Tissue from Stem Cells and Natural Matrices

Grant Award Details

Building Cardiac Tissue from Stem Cells and Natural Matrices

Grant Type: New Faculty II

Grant Number: RN2-00921

Project Objective: Generation and testing of hESC-CM bearing cardiac patches.

Investigator:

Name:	Kara McCloskey
Institution:	University of California, Merced
Type:	PI

Disease Focus: Heart Disease

Human Stem Cell Use: Embryonic Stem Cell

Award Value: $1,656,083

Status: Closed

Progress Reports

Reporting Period: Year 1

View Report

Reporting Period: Year 2

View Report

Reporting Period: Year 3

View Report

Reporting Period: Year 4

View Report

Reporting Period: Year 5

View Report

Grant Application Details

Application Title: Building Cardiac Tissue from Stem Cells and Natural Matrices

Public Abstract: Congestive heart failure afflicts 4.8 million people, with 400,000 new cases each year. Myocardial infarction (MI), also known as a "heart attack", leads to a loss of cardiac tissue and impairment of left ventricular function. Because the heart does not contain a significant number of multiplying stem, precursor, or reserve cells, it is unable to effectively heal itself after injury and the heart tissue eventually becomes scar tissue. The subsequent changes in the workload of the heart may, if the scar is large enough, deteriorate further leading to congestive heart failure. Many stem cell strategies are being explored for the regeneration of heart tissue, however; full cardiac tissue repair will only become possible when two critical areas of tissue regeneration are addressed: 1) the generation of a sustainable, purified source of functional cardiac progenitors and 2) employment of cell delivery methods leading to functional integration with host tissue. This proposal will explore both of these 2 critical areas towards the development of a living cardiac patch material that will enable the regeneration of scarred hearts.

Statement of Benefit to California: The research proposed in expected to result in new techniques and methodology for the differentiation of stem cell-derived cardiomyocytes and delivery methods optimal for therapeutic repair of scarred heart tissue after a heart attack. The citizens of California could benefit from this research in three ways. The most significant impact would be in the potential potential for new medical therapies to treat a large medical problem. The second benefit is in the potential for these technologies to bring new usiness ventures to the state of California. The third benefit is the stem cell training of the students and postdocs involved in this study.